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The largest number of hybrids secured in any one year were 6, produced in 1898. It is disappointing to the hybridologist to find in this list almost no data of any scientific significance regarding these hybrids. The brief comments made in connection with each cross refer purely to the value of the result for decorative or other economic purposes, and no definite comparison is made between the characters of the hybrid and those of its parents, except occasionally in regard to cultural matters.—GEO. H. SHULL.

Position of Gnetales.—LIGNIER and TISON[25] have applied their anatomical methods to the so-called "flower" of the Gnetales, and have reached the conclusion that the group belongs to angiosperms, among the Amentales; and that it probably represents a reduction series derived from the "base of the angiosperm trunk." This carries one back to the old conflict over gymnospermy; and in fact the interpretation of the ovule of Gnetales is almost identical with that of the ovule of gymnosperms nearly 100 years ago, for it reads "un ovaire fermé, prolongé en style et stigmate et ne renfermant qu'un seul ovule réduit au nucelle." This conclusion is a good illustration of the use of selected testimony rather than of all available testimony; an eclectic rather than a synthetic judgment. One might imagine a reduction series resulting in an open ovary, for there are open ovaries among angiosperms; but that such a series could result in the reappearance of such structures as archegonia, etc., is beyond the reach even of scientific imagination.—J. M. C.

Cytase and cytocoagulase.—GRÜSS[26] continues his studies upon gum-formation in the cherry and peach. He attributes it to the action of cytase upon the hemicellulose (especially galactans) of the secondary layer of wood vessels. Quantitative analysis shows 4 per cent of the wood vessels to be galactans. Excessive gumming he attributes to abnormally high cytase action. In the spring, when there is a general digestion of the reserved materials, he could detect a dissolution of the secondary layers of the wood vessels in the neighborhood of the cambium. Cytase was also abundant in this region and the vessels were filled with gum. In autumn he finds in the cambium region an enzyme which deposits an insoluble product from the gum, which gives the reactions of hemicellulose; he calls this condensing enzyme "cytocoagulase." The papers of GRÜSS are thrown together in such a way that careful perusal leaves one in doubt as to his exact meaning.—WILLIAM CROCKER.

Germination.—GASSNER[27] continues his studies on the germination of the South American grasses, the present paper reporting on *Stenotaphrum gla-*

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[25] LIGNIER, O., et TISON, A., Les Gnétales sont des Angiospermes apétales. Compt. Rend. Acad. Sci. Paris **152**:201–204. 1911.

[26] GRÜSS, J., Ueber das Verhalten von Cytase und Cytokoagulase bei Gummibildung. Jahrb. Wiss. Bot. **47**:395–430. 1910.

[27] GASSNER, GUSTAV, Ueber Keimungsbedingungen einiger südamerikanischer Gramineensamen. Ber. Deutsch. Bot. Gesell. **28**:504–512. 1910.

brum and *Paspalum dilatatum*. In the former light is not necessary for germination; but it shortens the required "after-ripening" period and increases somewhat the percentage of germination. For complete "after-ripening" 30 or more weeks of dry storage are required. A period in a seed bed at low temperature does not favor germination. In *P. dilatatum* 1 or 2 weeks at 50–60° C. dry storage brings about after-ripening. A period in the seed bed at low temperature is effective if it follows 20–30 weeks of dry storage. In this species light does not favor germination. This paper, as did the earlier one,[28] shows lack of exact analytical methods.—WILLIAM CROCKER.

Embryo sac and embryo of Clematis.—SOUÈGES[29] has undertaken the investigation of the embryo and embryo sac of the Ranunculaceae, the four parts cited dealing with the Clematideae. The general situations in the family are well known, so that the usefulness of the present account consists in the elaboration of the details of a single tribe, presumably to be followed by similar accounts of other tribes. Perhaps there is some over emphasis of a definite sequence of stages in embryo-formation, for cell-successions have proved to be quite variable, and such uniformity as can be observed is probably an indication of the uniformity of conditions in which the successive divisions occur. There is certainly evidence of a lack of familiarity with the literature of the subject.—J. M. C.

The embryo of the Bromeliaceae.—GATIN[30] has investigated the structure of the mature embryo and the germination of representatives of the Bromeliaceae. The three tribes were represented by a species from each of the following genera: *Karatas*, *Billbergia*, *Aechmea*, *Puya*, and *Tillandsia*. The variations uncovered are so considerable, and so doubtful as to their significance, that no general conclusion can be reached. The paper, therefore, is a contribution of facts that may become of service.—J. M. C.

Light a form-stimulus.—DUBARD and BUCHET[31] believe that light intensity determines the nature of the relief configuration of the hymenial surface of *Merulius lacrymans*. In high light intensity the surface shows high irregularly anastomosing ridges and deep depressions. In low intensity the furrows and ridges are less marked, and are arranged parallel to the incident rays of light. —WILLIAM CROCKER.

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[28] BOT. GAZETTE **51**:76–77. 1911.

[29] SOUÈGES, E., Recherches sur l'embryogénie des Renonculacées. Bull. Soc. Bot. France IV. **10**:242–250, 266–275, 509–517, 569–576. *figs. 56.* 1910.

[30] GATIN, C.-L., Premières observations sur l'embryon et la germination des Broméliacées. Rev. Gén. Botanique **23**:49–66. *figs. 32.* 1911.

[31] DUBARD, M. M., et BUCHET, S., De l'action de la lumière sur le *Merulius lacrymans*. Bull. Soc. Bot. France **57**:417–420. 1910.